

# METACOGNITION AND DECISION MAKING: BETWEEN FIRST AND THIRD PERSON PERSPECTIVE

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## ABSTRACT

The aim of the article is firstly, to show how metacognitive monitoring, control (regulation) and meta-knowledge are important in guiding decision making and secondly, to argue that researching experience is necessary for a more complete understanding of the role of metacognition in decision making. In the context of dual process theories of cognition it is sometimes proposed that people usually do not deliberate or reflect on their judgments and decisions, but rather follow their intuitions. Some metacognition researchers propose that metacognitive experiences (such as feeling of rightness or difficulty) play an important role in determining whether we change our intuitive responses for more deliberate, reflective reasoning and decision making. Although metacognition researchers' contribution to understanding the role of metacognitive experiences in decision making is valuable, their studies face some serious problems. Furthermore, it is not only our experiences, but also our evaluations of those experiences (metacognitive judgments) and our metacognitive knowledge that influence our judgments and choices. I argue that if we want to understand how and why people decide, we should be studying the entanglement of all these influencing factors from first and third person perspective. We should also conduct more thorough first person research. I conclude the article by arguing that first and third person perspective on metacognition and decision making should mutually constrain and inform each other about insights and contradictions that arise between them.

## KEY WORDS

metacognition, decision making, intuition, deliberation, self-observation

## CLASSIFICATION

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## **INTRODUCTION**

Are we self-reflective in our judgments and decisions or is our behavior simply guided by intuitive processes? Is the role of emotions and feelings only to lead us astray from normatively “correct” judgments and optimal decisions, biasing and producing errors or does it help us in navigating complex environment we live in? What is the role of various metacognitive processes (metacognitive feelings, judgments and knowledge) that enable monitoring and control of decision making processes? As we shall see, metacognitive feelings (e.g. feeling of rightness, difficulty, fluency, etc.) are many times determining whether we accept our intuitive responses or change them for more deliberate, reflective strategies of reasoning and deciding. Our metacognitive capabilities are on one hand limited, but on the other very important for guiding our judgments and decisions. Various experiments on risky choices, metacognitive feelings of fluency and decision difficulty point to a complex nature of answers to questions such as what actually is decision making, why we choose as we do, when and why we avoid decisions, how we experience decision making, etc. Research on the influence of metacognitive experiences, beliefs and knowledge on decision making and cognition in general indicates that our metacognitive experiences are interwoven with our goals, our beliefs, theories about the source of our experiences, knowledge about our own cognition and cognition in general.

Although studies and theoretical considerations of metacognitive researchers are very valuable for a better understanding of decision making (they are not only testing how well people perform on tasks, but are trying to study experiences as well), they are faced with some serious problems. It is for example questionable whether methods they use really offer insight in the rich experiential world, participants in their experiments are not trained self-observers, etc. Third person approaches, being informative about how people decide in some regards, are not telling the whole story. We need to research experience of decision making and metacognition more thoroughly leaving room for a more open, subject oriented approach.

## **WHAT IS METACOGNITION?**

A classical definition of metacognition is “... knowledge and cognition about cognitive phenomena ...” [1; p.906], generally and broadly understood as cognition about cognition or thinking about thinking. Nelson and Narens [2] were the first to depict the relationship between cognition and metacognition in a schematic way. The basic structure they propose is that there are two interrelated levels of cognitive processes, the object-level and the meta-level. The meta-level “contains a dynamic model (e.g., a mental simulation) of the object level” [2; p.126]. This assumption is necessary if the meta-level is to control the object-level. There are two dominance relations between the two levels: control and monitoring. Meta-level controls the object-level by initiating an action, continuing an action or terminating an action and. The information on which control is based flows from the object-level to meta-level (monitoring). In this way “A system that monitors itself (even imperfectly) may use its own introspections as input to alter the system's behaviour.” [2; p.128].

Koriat explains this relation in the following way: “The object level includes the basic operations traditionally subsumed under the rubric of information processing – encoding, rehearsing, retrieving, and so on. The meta-level is assumed to oversee object-level operations (monitoring) and return signals to regulate them actively in a top-down fashion (control). The object level, in contrast, has no control over the meta level and no access to it.” [3; p.290].

This characterization of the meta-object-level relation might be understood to imply that metacognition is always metarepresentational – object-level carrying first-order representations,

meta-level carrying second-order representations of the object-level. This could seem obvious, especially if we understand metacognition as being principally thinking about thinking as some do [4]. This stricter definition of metacognition is defended by Carruthers and Fletcher [4-5] who claim that if a process is to count as metacognitive it is necessary for it to be metarepresentational. By this definition metacognitive feelings (also called epistemic feelings, noetic feelings and metacognitive experiences<sup>1</sup>) arguably do not count as metacognitive. On the other hand others [3, 6-8] propose a weaker definition of metacognition which sometimes involves metarepresentations and sometimes not<sup>2</sup>. They claim that metarepresentational character of cognitive processes is not relevant in defining metacognition. Metacognitive processes can be metarepresentational or can be just “first-order representations happening to be about internal rather than external states. In a nut-shell, they are first-order but self-directed, as opposed to world-directed” [8; p.311]. Metacognitive experiences can be said to be metacognitive “insofar as their intentional contents yield information (or misinformation) concerning one’s own epistemic states, processes, and abilities” [8; p.310]. On the other hand, metacognitive judgments, beliefs and knowledge (if about our own cognition) usually are metarepresentational, but they count as metacognitive principally because they inform us of our own cognitive processes, guiding our decisions, judgments and behaviour. Koriart for example gives the following (weaker) definition of metacognition: “Metacognition research concerns the processes by which people self-reflect on their own cognitive and memory processes (monitoring) and how they put their metaknowledge to use in regulating their information processing and behaviour (control)” [3; p.289]. Metacognition in this weaker sense encompasses many phenomena, including metacognitive monitoring, metacognitive control and metacognitive knowledge.

## **METACOGNITIVE MONITORING AND CONTROL**

Dunolsky and Metcalfe define metacognitive monitoring as “assessing or evaluating the on-going progress or current state of a particular cognitive activity” [7; p.3] and metacognitive control as “regulating an on-going cognitive activity, such as stopping the activity, deciding to continue it, or changing it in the midstream” [7; p.3]. Metacognitive control would not be possible without monitoring (usually understood to be conscious<sup>3</sup>) of what is going on in our own minds. Information available to our conscious “experience” about our own cognitive processes and activities comes both from our metacognitive feelings and our general knowledge about our own mind. This information is then used for forming judgments, guiding behaviour and decision making processes. It has to be pointed out that the information available to conscious monitoring can be “mis-informative” because it is sometimes “contaminated” by impressions formed by our unconscious processes. This means that the available information which is for example biased by anchors or primed might lead to incorrect judgments or “non-optimal” decisions.

Imagine a student (example adapted and expanded from [7]) who after some time judges (judgment of learning) that she has a hard time remembering the lobes of the brain (metacognitive conscious feeling of difficulty as information for monitoring, about unconscious processes of learning and remembering). She therefore decides to dedicate more time (control) to this particular material or decides to change her learning strategy by inventing a song about the four lobes. On the other hand, our student could experience fluency in learning the four lobes (ease of learning) and proceed to studying other things. This can be helpful in guiding her decision to put more effort in things she does not yet know well, but can also lead to bad performance on the test. This can happen if she for example misjudged how well she remembered the four lobes. In this case the feeling of ease of learning would be erroneously

cueing her decision that stopping is a good idea. But the picture is more complex, since her decisions are also based on her knowledge about her own cognition and cognition in general.

## **EXPERIENCE-BASED AND THEORY-BASED METACOGNITIVE JUDGMENTS**

Koriat [3] distinguishes two kinds of information we base control of our cognitive processes on:

- 1) Experience-based metacognitive judgments (judgments and decisions based on our metacognitive feelings).
- 2) Theory based metacognitive judgments (judgments and decisions based on our metacognitive knowledge).

Experience-based metacognitive judgments are based on subjective metacognitive feelings. It is important to note that the sources and mechanisms that produce metacognitive feelings are not observable (cannot be introspected). They are considered as an “end product” of the unconscious, intuitive processes [3, 9] and inform us – in an indirect an “interpretative” way – about those inaccessible unconscious processes (mechanisms). Price and Norman stress that as intuitive feelings are used to “guide behaviour in a controlled and contextually sensitive manner that would not be permitted by purely non-conscious influences on behaviour” [10; p.28].

On the other hand it is not only metacognitive experiences that guide our judgments and decisions but also theories (metacognitive knowledge) we have about cognition (and decision making). Dunlosky and Metcalfe [7] define metacognitive knowledge as declarative knowledge about cognition (they basically mean declarative knowledge but one that is about cognition). Flavell [1] further categorizes metacognitive knowledge into three categories:

- 1) the person category of metaknowledge includes our knowledge about what we believe about ourselves and other persons as “cognitive processors”,
- 2) the task category includes knowledge about a specific cognitive task, how should it be managed, how successful we are at achieving it, etc. and
- 3) the strategy category which includes knowledge about the effectiveness of strategies employed in achieving a goal or a subgoal.

It should be stressed that what most metacognitive researchers consider as metaknowledge is not only knowledge about our own cognitive processes but also knowledge about cognition in general if we use this knowledge to regulate our own cognitive processes and behaviour<sup>4</sup>.

To return to our student, her metacognitive knowledge about cognition in general and her own cognition is important as well: she knows that creating poems (metacognitive strategy) is helpful for remembering list of items. But if she has experience that she is terrible at remembering poems (her metaknowledge about her own cognition) she would probably ignore the strategy, try another strategy or give up on finding a strategy and stay with repeating the lobes.

Koriat's distinction of experience-based metacognitive judgments and theory-based metacognitive judgments (metacognitive knowledge) [3] is similar to what is proposed by many dual process/system theories of human cognition, namely the distinction between two types of processing, one being more intuitive, the other more deliberate, analytic.

## **METACOGNITION IN THE CONTEXT OF DUAL PROCESS THEORIES**

In the last decades cognitive science has seen many theories describing a kind of basic duality of human mind (for reviews see [11-13]). They were proposed as a theoretical framework for explaining various cognitive processes (decision making, (social) judgments, memory,

learning, thinking, reasoning, etc.) or as a generic theory of human cognition. Some of them advocate the stronger claim that human cognition is composed of two relatively separate and autonomous systems implying a dual system architecture of human mind and/or brain (dual system theories). Others advocate the weaker claim of human cognition being composed of two (or more) distinct types or modes (Evans [13]) of cognitive processing which does not presuppose two architecturally distinct systems of human mind and/or brain (dual process theories). But both types of dual theories generally agree that human beings process information in two distinctly different ways. They divide cognitive processes into two categories according to certain characteristics they possess – processes that are fast, automatic, parallel, unconscious, high capacity, intuitive, contextualized and undemanding of working memory, etc., fall under the category of type 1 or System 1, processes that are slow, sequential, conscious, low capacity, deliberate, abstract and demanding of working memory fall under the category of type 2 or System 2.

Being a useful two-category distinction for explaining various cognitive phenomena some authors claim this distinction is too simple. Stanovich [14] proposed that we should not talk about System 1 processes but instead talk about the autonomous set of systems (TASS) which emphasizes the heterogeneity of various type 1 processes which are autonomous, automatized, respond automatically to triggering stimuli and are not under the control of deliberate (analytic) processes. He also proposed a division of System 2 into two levels, the algorithmic and the reflective level of processing. His idea of reflective mind comes roughly from the observation that some critical thinking biases (e.g. myside thinking, belief bias) are relatively independent of intelligence – individual differences in such critical thinking tasks are better predicted by thinking dispositions or cognitive style tests (e.g. need for cognition, actively open/minded thinking, etc.) than IQ tests. The main role of the reflective mind is the initiation of cognitive decoupling by sending “out a call to begin cognitive simulation or hypothetical reasoning more generally” [14; p.62]. On the other hand, the function of the algorithmic mind is to sustain cognitive decoupling that is necessary for hypothetical reasoning. According to Stanovich, the capacity for cognitive decoupling (initiation and sustenance) is necessary for taking intuitive “response tendencies” offline. This in turn enables one to substitute these intuitive responses for “better” / different responses.

Similarly, although emphasizing the influence of metacognitive experiences in the process of making decisions or judgments (online), metacognitive researcher Valerie A. Thompson proposes that “the regulation of S2 intervention requires a third type of processes that is not captured by the S1/S2 distinction”, (S1 meaning System 1, S2 System 2) [15; p.180], namely metacognitive processes (in the weaker sense, as described at the beginning). According to Thompson [15] one of the functions of metacognition is to monitor outputs (metacognitive experiences or feelings) of intuitive, unconscious processes to guide decisions of whether to intervene when for example a conflict between our goal and an intuitive response is detected. These metacognitive experiences are further interpreted by second-order judgments (metacognitive judgments about metacognitive feelings) which determine whether to accept the intuitive response or start a more deliberate analysis of the problem, decision, judgment.

Kahneman [16; p.717] proposed four ways in which decisions or judgments can be made after an intuitive judgment, decision or intention is initiated. Intuitive judgments and decisions can be:

- 1) accepted by System 2 (type 2 deliberate, analytic processes) processes,
- 2) adjusted (many times insufficiently when for example primed or anchored),

3) corrected (or overcorrected) when (and if) we recognize that our judgment or decision is biased by irrelevant information to the task such as affect,

4) blocked: Kahneman states this is least possible. But some experiments concerning affective self-control show that in fact the effect of emotions on thoughts and behaviour can be blocked (at least in some situations) using various metacognitive strategies (e.g. delaying gratification [17], the ability to work through negative emotions without increasing their negative affect by taking a more reflective stance towards our emotional memories [18]).

When no intuitive response comes to mind (e.g. when having to calculate the square root of a large number) judgment or decision is carried out by System 2 processes.

Most of the time people accept their intuitive responses, adjust them incorrectly or insufficiently [16, 19], confabulate reasons for their choices and behaviour [4, 13], etc. The “imperfection” of metacognitive mechanisms of monitoring and control is due to what Kahneman [16] calls natural assessments, i.e. impressions we form unconsciously about objects and thoughts we perceive. What is accessible to our conscious awareness (for more deliberate processing) is already “contaminated” by primes, anchors, frames, emotions, salient properties of objects, etc. How for example a risky choice is made is determined by how options are formulated (framed) [20]. Frames influence what features are more accessible, which in turn biases our choices. In the Asian disease problem for example [21], positively framed choice options (framed as gains) lead to more loss aversive choices (choosing the sure-thing), negatively framed choice options (framed as losses) on the other hand, lead to more risk seeking choices (choosing the risky choice).

One of the important questions in studying judgments and decision making is why people usually accept their intuitive responses (already framed, primed, biased, etc.) and not change them by a more deliberate analysis of the problem, situation, choice options. Metacognitive researchers advocate the view that metacognitive experiences, conscious feelings that accompany intuitive processes, are an important determinant of that.

## **METACOGNITIVE EXPERIENCES AND COGNITIVE REFLECTION: BETWEEN INTUITION AND DELIBERATION**

Flavell nicely illustrates the richness of metacognitive experiences: “Metacognitive experiences can be brief or lengthy in duration, simple or complex in content. To illustrate, you may experience a momentary sense of puzzlement that you subsequently ignore, or you may wonder for some time whether you really understand what another person is up to. These experiences can also occur at any time before, after, or during a cognitive enterprise. For instance, you may feel that you are liable to fail in some upcoming enterprise, or that you did very well indeed in some previous one. Many metacognitive experiences have to do with where you are in an enterprise and what sort of progress you are making or are likely to make: You believe/feel that you have almost memorized those instructions, are not adequately communicating how you feel to your friend, are suddenly stymied in your attempt to understand something you are reading, have just begun to solve what you sense will be an easy problem, and so forth” [1; p.908].

How metacognitive experiences<sup>5</sup> such as feeling of rightness influence our judgments and choices can be illustrated by Cognitive reflection test (CRT) developed by Frederick. CRT consists of three “simple” questions [19; p.27]:

1) A bat and a ball cost 1,10 US\$ in total. The bat costs 1,00 US\$ more than the ball. How many cents does the ball cost? \_\_\_\_\_ cents

2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? \_\_\_\_\_ minutes

3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? \_\_\_\_\_ days

In the first problem the answer 10 cents<sup>6</sup> comes rapidly to mind and as Frederick's result show, most people accept such quick responses without any further deliberation, following their "impulsive", intuitive responses (at least in such tasks). Even top end university students (MIT or Princeton) made many mistakes on CRT. MIT students scored highest with a mean score of 2,18 (48 % of them getting all 3 answers correct), followed by Princeton university students with a mean score of 1,63 (only 26 % of them getting all 3 answers correct). University of Toledo students (not considered a top end university) were the worst with a mean score of 0,57 (only 5 % getting all 3 answers correct).

An explanation offered by Thompson [15] is that CRT questions elicit a strong metacognitive feeling of rightness (FOR; feeling of correctness of the answer that comes intuitively to mind). It is this strong FOR which is responsible for people not overriding their intuitive response (the test is designed on purpose so as to elicit fluent and "persuasive" responses). According to Thompson metacognitive processes "provide a means to assess the output of one's cognitive processes and determine whether further action should be taken. ... It is this intuition, of Feeling of Rightness (FOR), that is the reasoner's cue to look no further afield for the answer." [15; p.175]. Especially relevant for the feeling of rightness is the role of fluency of retrieval: "metacognitive feelings are mediated by the fluency with which the information is brought to mind. On this view, the key to understanding the basis of the FOR is to understand that it is produced by a retrieval experience. That is, heuristic outputs are retrieved from memory, and this retrieval is accompanied by metacognitive experience, based on properties of that retrieval experience, such as fluency of processing. Moreover, given that heuristic attributes are highly accessible [7], even processed ballistically [14], the experience should be very fluent and result in a strong FOR"<sup>7</sup> [15; p.176]. Thompson, Prowse Turner and Pennycook [22] for example showed that a low feeling of rightness correlated with longer rethinking times and increased probability of answer change (both associated with more deliberate, analytic thinking). Furthermore, it was shown [23] that when CRT questions were printed in a hard to read font (eliciting a feeling of disfluency or difficulty), participants scored higher compared to when it was printed in an easy to read font, presumably thinking about the questions in a more deliberate, analytic way.

Frederick [19] also showed that when choosing between risky options, participants that scored high on CRT were more willing to take risks in the domain of gains (especially when gambles had higher expected value), but less willing to take risks in the domain of losses (when gambles had lower expected value). Participants, who on the other hand scored low on CRT showed the opposite behaviour: they were much less willing to take risks in the domain of gains (even though gambles had higher expected value than non-risky options) and much more willing to gamble in the domain of losses (even though gambles had smaller expected values than non-risky options). In the domain of gambles, maximizing gains seems as a good decision making strategy and the minority of participants that were more "able" to reflect<sup>8</sup> on and change their impulsive, intuitive responses for a more deliberate analysis were also more "successful" on the task.

Although such findings [19, 22] are generally believed to show that we usually do not deliberate too much when deciding or judging and that our (metacognitive) experiences are partly responsible for that, we should be careful about our conclusions. Even though such

research is indeed valuable in trying to take into account participants' experience it faces some problems: the use of questionnaires, self-rating scales and think-aloud protocols for gathering data about experiences is highly questionable (if not completely useless) from the perspective of phenomenology. In this regard answering the question of what participants "really" experienced, when choosing between risky options and monitoring their own choices (if at all) would require deeper and more subject (person) oriented look at the experiential world of participants.

Furthermore, some experiments [24] with risky choices show that the picture is much more complex than the one proposed by prospect theory and scores on CRT test. Wang [24] showed that negative and positive frames (in the Asian disease death-or-life scenarios) influence our decisions differently in different contexts. He showed that participants preferred risky choice options regardless of whether they were framed as losses (negative frame) or gains (positive frame) if the scenario included only a few individuals instead of 600 or if individuals it included were presented as family members. Participants explained that they were willing to risk (where people do not risk in classical choice problems) because they wanted to give everybody an equal chance of surviving (perceived fairness). Wang based his explanation of perceived fairness by at least considering participants' experiences in the form of post-experiment interviews. Unfortunately, he did not specify how interviews were conducted which is again of critical importance from the perspective of phenomenology, e.g. how to conduct phenomenological dialogues [25].

## **THE INFLUENCE OF METACOGNITIVE EXPERIENCES AND METACOGNITIVE KNOWLEDGE ON CHOICE**

Novemsky, Dhar, Schwartz and Simonson [26] indirectly showed that choices of consumers are influenced by their feeling of difficulty when forming preferences for choice options. Before making their choices between two products one half of participants were asked how easy or difficult it would be to name two reasons for their choice, the other half how easy or difficult it would be to name ten reasons for their choice. Participants rated naming ten reasons as more difficult (measured by a scale). Participants that were asked how difficult it would be to name ten reasons for their choice later deferred the choice more (61 % of participants) compared to participants that were asked how difficult it would be to name two reasons for their choice (49 % of participants). Similar findings on decision avoidance are reviewed by Anderson [27]. Schwartz [28] also showed that "maximizers" who analyse, deliberate on and compare different options much more persistently than "satisficers", when faced with abundance of choices, experience more regret, are less satisfied with their life, more prone to social comparison, experience less satisfaction with their choices and show bigger increase in negative mood than satisficers, when working on a task along with a peer that performs better than them. Further on it was shown [26] that participants deferred choice more, when choice options (between cordless telephones) were printed in difficult to read font (42 %) compared to choices printed in normal font (17 %). On the other, hand when participants were told that the font may be difficult to read the same percentage of participants deferred choice (16 %) regardless of the font. They could form a belief that their metacognitive experiences were contaminated by irrelevant factors. This finding is similar to a classical study [29] in the context of judgment where participants were asked to rate self-assertiveness in two conditions: they had to either recall a few (six) or many (twelve) episodes where they were assertive. In the few episodes condition they judged themselves as more assertive than in the many episodes condition. But when they were led to believe that the music playing in the background was causing their experienced difficulty in recalling many assertive episodes they rated themselves as more assertive in the many episodes condition.



Such research of processing fluency and decision difficulty points to a more complicated picture of what we base our decisions on, what choices we prefer, etc. Our metacognitive experiences are interwoven with our goals, our beliefs, theories about the source of our experiences, our motivations, social context, etc. Oppenheimer states that “people do not use fluency blindly as a cue for judgment but attempt to attribute it to the appropriate source. This leads people to develop naive theories about the causes of their fluency experience and to apply fluency accordingly ... when there is an obvious alternative cause for fluency people will spontaneously discount the fluency experience, and the effects of fluency on judgment will be diminished or reversed ... Thus, the interpretation of a fluency experience relies on past experience and the current context, and depending on the interpretation, fluency can have very different influences on judgment.” [30; p.238]. Our choices are influenced by diverse factors: metacognitive experiences, judgments of metacognitive experiences, accessible declarative information and theories we use to interpret them [31]. If our choices were completely bound by our metacognitive experiences or similarly by strong emotions we would not be able to be flexible in our decisions adapting them to our goals, beliefs and values. If we never had the opportunity to monitor and self-reflect on our intuitive responses, we would be bound to “chains of the moment”. On the other hand our metacognitive experiences and also emotions [32] help us navigate the complex world we live in. It is this entanglement of experiences and beliefs (metacognitive and cognitive) we should take a close look at: from a third person perspective and maybe even more so from a first person perspective, especially if we are to understand how each individual experiences and makes decisions.

## **THE IMPORTANCE OF FIRST PERSON RESEARCH OF DECISION MAKING AND METACOGNITION**

What are people really experiencing as they experience the feeling of rightness or difficulty when judging and deciding? What does it mean for people to experience such feelings and how do these experiences influence each individual’s decisions from their own perspective? Researching metacognitive experience, and not only testing how well people perform on certain tasks or tests, is a very valuable contribution of researchers working in the field of metacognition. On the other hand metacognition research faces some serious problems and more thorough first person research is needed.

First, it is questionable whether self-rating scales, questionnaire and think-aloud protocols – often used for gathering data about experiences in metacognition research community – are good methods for “measuring” experiences at all. Questionnaires and self-rating scales already predefine the contents of reports about experiences and put the experimenter (or questionnaire designer) as the “judge” of what these experiences mean. If we want to understand how each unique individual decides, perceives and experiences his/her own decisions, we have to admit that the person in question is the only expert of his/her own experiences [25].

Secondly, participants in experiments are not trained self-observers and are thus not good reporters of experiences, at least from the perspective of phenomenology and some meditation traditions (especially Buddhist). Self-awareness and self-observation are essentially skills that have to be learned and cultivated [34] by sustained practice and attitude towards our own experience. In this sense some meditation practices propose cultivating a state of mindfulness where people can be curious (non-judgmental) towards their own experiences: “Mindfulness is further defined by an orientation to experience that is adopted and cultivated in mindfulness meditation practices. This orientation begins with making a commitment to maintain an attitude of curiosity about where the mind wanders whenever it inevitably drifts away from the breath, as well as curiosity about the different objects within one’s experience at any moment. All thoughts, feelings, and sensations that arise are initially

seen as relevant and therefore subject to observation. The client thus is not trying to produce a particular state such as relaxation or to change what he or she is feeling in any way. Rather, the client is instructed to make an effort to just take notice of each thought, feeling, and sensation that arises in the stream of consciousness” [33; p.233].

Last but not least, studying cognitive phenomena only from the third person perspective can render us vulnerable to interpreting the data in a wrong way. To echo Thomas Nagel’s question “how it is like to be bat” [35] we should be asking “how it is like to be a decision maker”. We should try to use third person data and experiential reports to mutually constrain [34] first and third person perspectives on metacognition and decision making. In his seminal article *Neurophenomenology, A Methodological Remedy for the Hard Problem* Varela proposed such a strategy. Explaining the hypothesis of neurophenomenology to tackle the hard problem of consciousness more productively, he states: “only a balanced and disciplined account of both the external and experiential side of an issue can make us move one step closer to bridging the biological mind-experiential mind gap. ... The key point here is that by emphasizing a co-determination of both accounts one can explore the bridges, challenges, insights and contradictions between them. This means that both domains of phenomena have equal status in demanding a full attention and respect for their specificity. It is quite easy to see how scientific accounts illuminate mental experience, but the reciprocal direction, from experience towards science, is what is typically ignored. What do phenomenological accounts provide? At least two main aspects of the larger picture. First, without them the firsthand quality of experience vanishes, or it becomes a mysterious riddle. Second, structural accounts provide constraints on empirical observations” [34; p.343].

## CONCLUSIONS

In the article I tried to show that our monitoring and control metacognitive capabilities and our metacognitive knowledge influence our decision making. Our metacognition is on one hand limited, but on the other hand very important for guiding our judgments and decisions helping us to navigate the complex world we live in. Various experiments on risky choices, metacognitive feelings of fluency and decision difficulty show that it is not only metacognitive experiences that influence our choices but also our metacognitive judgments we form about our experiences. Such research combined with further theoretical considerations points to a more complex nature of the role of metacognition in decision making.

What theories and studies of the role of metacognition in decision making mostly do not take into account (their experimental tasks are not designed in such a way) is that decision making is hardly similar to simple choice scenarios presented to participants in experiments. In such simple choice scenarios all choice alternatives are normally pre-given and do not have to be generated by the decision maker him/herself. Also, choice environments are mostly stripped of all context, social situatedness, etc. Furthermore, I believe we should put more emphasis on studying decision making as a long-term process that is continuously unfolding (decisions being repeated and made over longer periods of time). We should also look at how metacognitive processes influence decision making when we are not making decisions, for example when we are evaluating past decisions.

In conclusion I would like to emphasize two things: firstly, we should consider the entanglement and co-determination of metacognitive experiences, beliefs, theories, post-decisional evaluations and the context in which we make decisions, if we want to understand how and why people decide. And secondly, we should study decision making processes and our capacity to self-reflect and self-observe our own minds from first person and third person perspective, exploring “bridges, challenges, insights and contradictions between them” [34; p.343]. If we

do not try to strive towards these goals we will be leaving out a lot of what, in my opinion, essentially constitutes metacognition and decision making.

## REMARKS

- <sup>1</sup>I will use terms metacognitive experiences and metacognitive feelings interchangeably. To distinguish emotions from feelings, Scherer defines feelings as “the subjective emotional experience component of emotion, presumed to have an important monitoring and regulation function” [36; p.699]. Metacognition researchers see metacognitive feelings in such way with two additional comments: metacognitive feelings are usually thought of as being directed towards one self and besides their usually affective character they are seen as cognitive as well, sometimes lacking affect (similarly to Scherer’s cognitive appraisal).
- <sup>2</sup>When using the term metacognition I will refer to the weaker sense without implying that a process is metarepresentational.
- <sup>3</sup>Metacognitive processes are usually understood as conscious processes, but monitoring and control can also operate on an unconscious level – the degree to which they are conscious is disputable and an unresolved issue.
- <sup>4</sup>It is arguable if knowledge about cognition in general could really count as metacognition, metacognitive knowledge.
- <sup>5</sup>There are many different metacognitive feelings described in literature on metacognition: feelings of knowing/not knowing, tip-of-the-tongue experiences, feelings of certainty/uncertainty, feelings of confidence, feelings of ease of learning, feelings of competence, feelings of familiarity, feelings of *déjà vu*, feelings of rationality/irrationality, feelings of rightness, feeling of difficulty [12]. Some of them are more connected to decision making, others less (like tip-of-the-tongue-experiences). In this article I primarily focus on the feeling of rightness and the feeling of difficulty.
- <sup>6</sup>The correct answers are for (1) 5 cents, for (2) 5 minutes and for (3) 47 days, whereas the intuitive, most common responses are for (1) 10 cents, for (2) 100 minutes and for (3) 24 days.
- <sup>7</sup>The use of the term heuristic in this context is somehow problematic, since heuristics can also be fast deliberate shortcut strategies used to improve judgments and decisions, for example take-the-best heuristic [37].
- <sup>8</sup>The question of whether participants really did reflect more on their intuitive answers or were just more analytical thinkers in general remains open.

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## **METAKOGNICIJA I ODLUČIVANJE: IZMEĐU PERSPEKTIVA PRVOG I TREĆEG LICA**

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### **SAŽETAK**

Ciljevi ovog članka su, kao prvo, pokazati kako su metakognitivno promatranje, kontrola (regulacija) i meta-znanje značajni u upravljanju odlučivanjem, a kao drugo diskutirati koliko je istraživačko iskustvo neophodno za cjelovitije razumijevanje uloge metakognicije u odlučivanju. U kontekstu kognitivnih teorija dualnog procesa katkad se smatra kako ljudi uobičajeno ne planiraju ili preispituju svoje prosudbe i odluke, nego češće slijede svoju intuiciju. Neki istraživači metakognicije smatraju kako metakognitivna iskustva (poput osjećaja pravde ili poteškoće) zauzimaju znatnu ulogu u određivanju da li mi mijenjamo intuitivne reakcije za više namjeravana, preispitana zaključivanja i odlučivanja. Iako su istraživanja metakognicije znatno doprinijela razumijevanju uloge iskustva u metakognicije, ta istraživanja prate neki ozbiljni problemi. Nadalje, ne samo naša iskustva nego i naše procjene tih iskustava (metakognitivne prosudbe) te naše metakognitivno znanje utječu na naše prosudbe i odabire. Tvrdim da ako želimo razumjeti kako i zašto ljudi odlučuju moramo proučavati povezano sve navedene utjecaje iz perspektive prvog i trećeg lica. Moramo također provedti više sustavnih istraživanja prvog lica. Članak zaključujem tvrdeći kako se perspektive prvog i trećeg lica u metakogniciji i odlučivanju moraju međusobno uvjetovati i nadopunjavati o uvidima i proturječnostima koje između njih nastaju.

### **KLJUČNE RIJEČI**

metakognicija, odlučivanje, intuicija, namjera, autoopservacija